

(19)日本国特許庁 (JP)

## (12) 公開実用新案公報 (U)

(11)実用新案出願公開番号

実開平5-10124

(43)公開日 平成5年(1993)2月9日

(51)Int.Cl. B 60 R 21/20 B 62 D 1/11 H 01 H 13/08	識別記号 8309-3D 9142-3D 7161-5G	府内整理番号 F I	技術表示箇所
--	---------------------------------------	---------------	--------

審査請求 未請求 請求項の数1(全3頁)

(21)出願番号 実願平3-58789	(71)出願人 000241463 豊田合成株式会社 愛知県西春日井郡春日町大字落合字長畑1 番地
(22)出願日 平成3年(1991)7月25日	(72)考案者 金井 真 愛知県西春日井郡春日町大字落合字長畑1 番地 豊田合成株式会社内
	(72)考案者 水谷 浩一 愛知県西春日井郡春日町大字落合字長畑1 番地 豊田合成株式会社内
	(74)代理人 弁理士 恩田 博宣

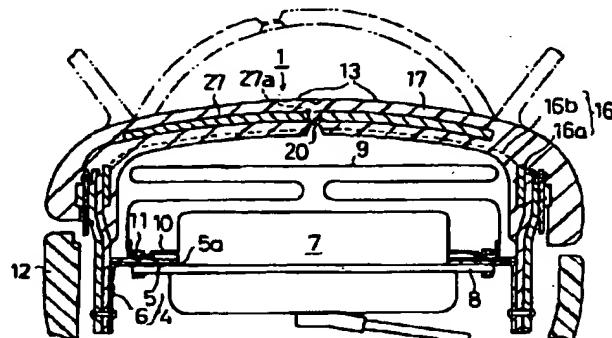
最終頁に続く

(54)【考案の名称】 エアバッグを備えたステアリングホイールのパッド

## (57)【要約】

【目的】 通常の押圧力でパッドのほぼいずれの位置を押してもホーンを鳴らすことができ、かつ、エアバッグ膨張時には、容易に拡開されるエアバッグを備えたステアリングホイールのパッドを提供する。

【構成】 エアバッグ9を備えたステアリングホイールのパッド1内に配設されるメンブレンスイッチ27をパッド1の拡開部13内のはば全面に配置するとともに、メンブレンスイッチ27のうち破断部20に該当する部分には、破断されやすいように破断部20に沿って複数の長孔27aを設け、エアバッグ9が膨張する際に、破断部20にて容易に破断されるようにした。



BEST AVAILABLE COPY

(2)

実開平5-10124

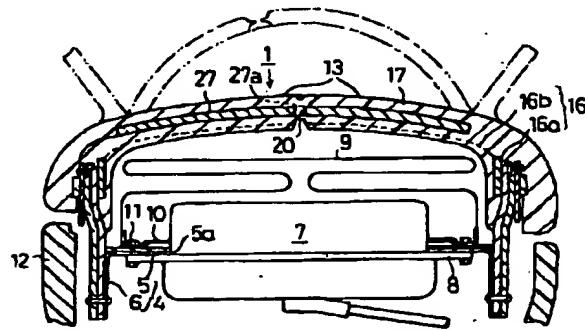
## 【実用新案登録請求の範囲】

【請求項1】 エアバッグ(9)の上方を覆うようにして配置され、同エアバッグ(9)の膨張により破断されるパッド(1)内に面状スイッチ(27, 28, 29, 30)を有するとともに、前記エアバッグ(9)が膨張する際に、拡開部(13)が破断部(20)にて破断されることにより外方へ拡開されるエアバッグを備えたステアリングホイールのパッドであつて、  
前記面状スイッチ(27, 28, 29, 30)を前記拡開部(13)内のほぼ全面に配置するとともに、前記面状スイッチ(27, 28, 29, 31)のうち前記破断部(20)に沿って少なくとも1つの透孔(27a, 28a, 29a, 30a)を形成したことを特徴とするエアバッグを備えたステアリングホイールのパッド。

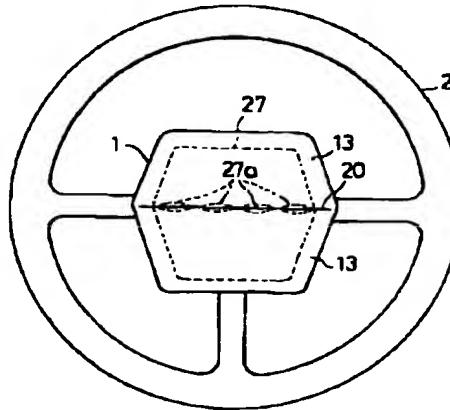
## 【図面の簡単な説明】

【図1】本発明の実施例におけるパッドを含むエアバッグ装置を示す部分断面図である。  
【図2】メンブレンスイッチを配置したステアリングホイールを示す平面図である。

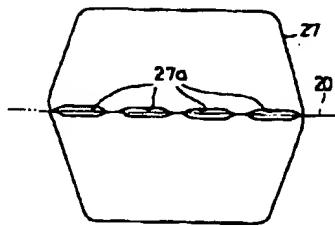
【図1】



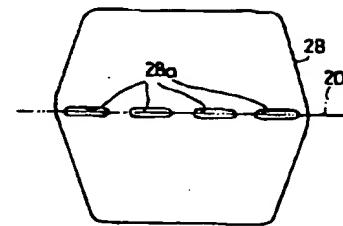
【図2】



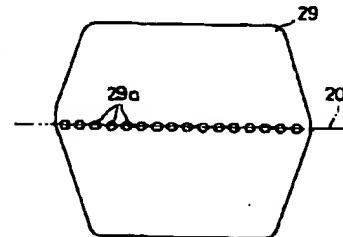
【図3】



【図4】



【図5】



【図3】メンブレンスイッチを示す平面図である。

【図4】別例のメンブレンスイッチを示す平面図である。

【図5】図4とは異なる別例のメンブレンスイッチを示す平面図である。

【図6】図5とは異なる別例のメンブレンスイッチを示す平面図である。

【図7】従来のエアバッグ装置を示す断面図である。

【図8】従来のステアリングホイールを示す平面図である。

【図9】従来のメンブレンスイッチを示す平面図である。

【図10】図9の部分断面図である。

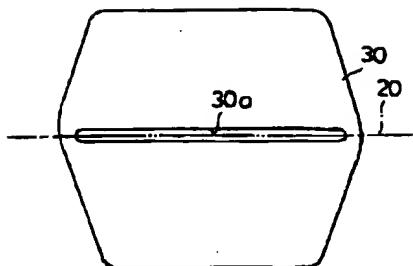
## 【符号の説明】

1…パッド、9…エアバッグ、13…拡開部、14…ヒンジ部、20…破断部、27, 28, 29, 30…面状スイッチとしてのメンブレンスイッチ、27a…透孔としての長孔、28a…透孔としての長孔、29a…透孔としての円孔、30a…透孔としての長孔。

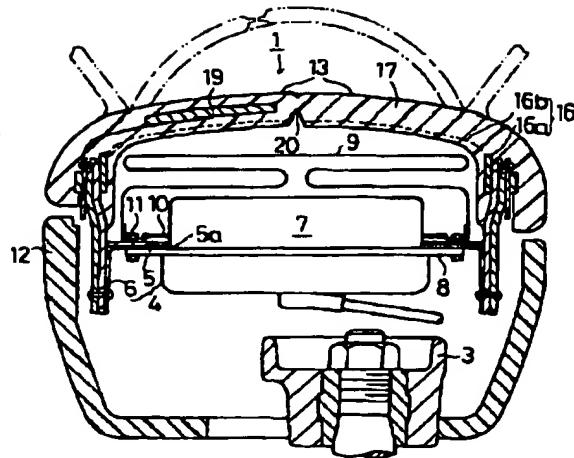
(3)

実開平5-10124

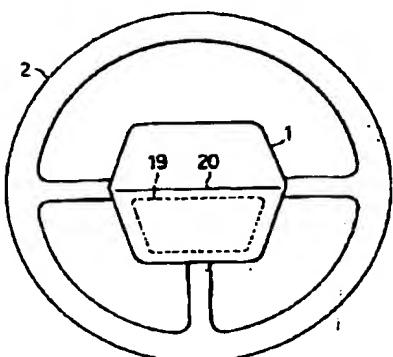
【図6】



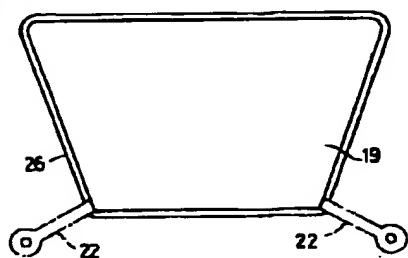
【図7】



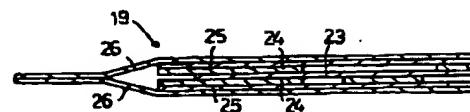
【図8】



【図9】



【図10】



フロントページの続き

(72)考案者 平光 徹至

愛知県西春日井郡春日町大字落合字長畑1

番地 豊田合成株式会社内

(72)考案者 井上 道夫

愛知県西春日井郡春日町大字落合字長畑1

番地 豊田合成株式会社内

**English translation of Laid-open Utility Model publication****5-10124****[Detailed Description of the Invention]****[0001]****[Field of the Invention]**

The present invention relates to a pad for a steering wheel which is expanded to open when an airbag is deployed, and more particularly, to a steering wheel pad having a film-like surface switch and equipped with an airbag.

**[0002]****[Prior Art]**

Conventionally, various types of steering wheel pads have been proposed for airbags, and among them is a steering wheel pad for an airbag which has a horn switch installed therein. For instance, as shown in Fig. 8, a pad 1 is disposed substantially at the center of a ring portion 2 of a steering wheel and constructed as below. Namely, as shown in Fig. 7, a metallic bag holder 4 is supported on a boss portion 3. This bag holder 4 comprises a substantially square, annular upper plate 5 having an insertion hole 5a at the center thereof and a side plate 6 extending downwardly from an outer circumferential edge of the upper plate 5.

**[0003]**

An inflator 7 is inserted into the insertion hole 5a in the bag holder 4 from below, and an upper surface of a flange portion 8 formed around the outer circumference of the inflator 7 is brought into abutment with a lower surface of the upper plate 5 of the bag holder 4. An airbag 9 is disposed on an upper portion of the inflator 7 in such a manner as to cover the inflator 7. A lower end portion of the airbag 9 is held on an upper surface of the bag holder 4 by means of an annular retainer 10 extending circumferentially from the inflator 7, and this retainer 10 and the lower end

portion of the airbag 9 are fixed to the upper plate 5 together with the flange portion 8 with bolts 11. In addition, the airbag 9 is usually stored in the steering wheel in a folded state and is adapted to be inflated upwardly with a gas generated from the inflator 7 when an impact is sensed.

[0004]

A resin lower cover 12 is disposed in such a manner as to cover the boss portion 3 and has an opening at an upper surface thereof. The pad 1 which is formed into a substantially box-like configuration with an opened lower surface is disposed on the opening at the upper surface of the lower cover 12 in such a manner as to cover the airbag 9. This pad 1 is constituted by an insert 16 for retaining the configuration and strength thereof, a resin cover 17 formed from a soft material such as polyurethane and polypropylene so as to cover the insert 16 and a surface membrane switch 19 interposed between the resin cover 17 and the insert 16. The insert 16 is formed by a substantially square, tubular frame body 16a and a net 16b mounted on an upper portion of the frame body 16a and formed of a high-strength fiber such as an aramid fiber in order to improve the durability of the pad 1 when it is ruptured.

[0005]

A rupturable portion 20 which is thinned is formed substantially at a central portion of the pad 1 in such a manner as to extend in a width direction (a transverse direction in Fig. 8). When the airbag 9 is inflated, the pad 1 is ruptured at this rupturable portion 20, and an expansion portion 13 at an upper portion of the pad is adapted to be expanded to open outwardly.

[0006]

As shown in Fig. 9, the membrane switch 19 is formed into a substantially trapezoidal shape, and terminals 22 shown by two-dot chain lines are constructed so as to extend from

sides of the membrane switch 19, and are electrically connected to a horn switch mechanism not shown.

[0007]

In addition, as shown in Fig. 10, the membrane switch 19 is constituted of a thin plate 23 of phosphor bronze, thin stainless steel plates 25 disposed on upper and lower surfaces of the thin phosphor bronze plate via electrically insulating projections 24 and transparent resin films 26 applied in turn so as to cover upper and lower surfaces of the upper and lower thin stainless steel plates, respectively, and when pressed from above by virtue of a pressing force, the stainless steel thin plates 25 and the thin phosphor bronze plate 23 are brought into contact with each other, and when an electrically conducting state is established therebetween, the horn is actuated. As shown in Fig. 8, the membrane switch 19 is disposed, for instance, in a portion of the pad which is more front than the rupturable portion 20 (a lower side of the pad in the figure) so that it does not prevent a rupture of the pad when the airbag 9 is inflated.

[0008]

Then, as shown in Fig. 7, when an impact is given, a gas is generated from the inflator 7 and the airbag 9 is inflated. In conjunction with this inflation of the airbag, the expansion portion 13 of the pad 1 is ruptured at the rupturable portion 20 to open upwardly in a curved fashion.

[0009]

[Problem that the Invention is to Solve]

It is ideal to the driver that he/she can actuate the horn by pressing any portion of the pad 1. In the pad constructed as described above, however, the membrane switch 19 is disposed only in a portion of the pad 1 which is more front than the rupturable portion 20. On the other hand, it is conceivable that another membrane switch, not shown, is disposed in a portion of the pad which is more rear than the

rupturable portion 20, in other words, two membrane switches are disposed so as to increase the area of the horn switch.

[0010]

However, the pad constructed as described above has problems that will be described below. In other words, in order to avoid preventing the rupture of the pad 1 when the airbag 9 is inflated, the membrane switch 19 cannot be disposed over the rupturable portion 20, and therefore there is no choice but to dispose two membrane switches 19. In this case, an additional conducting mechanism including terminals and lead wires for the switches has to be provided, thus causing a deterioration in assembling capability and moldability. Furthermore, in a case where the driver presses the pad in the vicinity of the rupturable portion 20 with a view to actuating the horn, since there is provided no membrane switch at the rupturable portion 20, he/she needs to press the pad with a relatively strong force, which is disadvantageous.

[0011]

The present invention was made to solve this problem, and an object thereof is to provide an airbag equipped steering wheel pad which allows a horn to be actuated by pressing substantially any portion of the pad with a normal amount of force, and which can easily be expanded to open when the airbag is inflated.

[0012]

[Means for Solving the Problem]

With a view to attaining the above object, according to the gist of the present invention, there is provided an airbag equipped steering wheel pad that is disposed so as to cover the airbag, which has a surface switch in a pad that is ruptured when the airbag is inflated and being adapted to be ruptured and in which an expansion portion is ruptured at a rupturable portion when the airbag is inflated so as to be

expanded to open outwardly, wherein the surface switch is disposed over substantially the whole surface of the expansion portion, and at least one through hole is formed along the rupturable portion of the surface switch.

[0013]

[Function]

Since the surface switch is disposed over substantially the whole surface of the expansion portion, the horn is actuated by pressing substantially any position of the pad. In addition, since there is at least one through hole formed in the surface switch along the rupturable portion so as to facilitate the rupture of the pad, the pad is securely ruptured when the airbag is inflated.

[0014]

[Embodiment]

Referring to the drawings, an embodiment will be described below in which the present invention is embodied. The present invention is embodied in the airbag device described in Fig. 7, and therefore what differs therefrom will only be described for the sake of convenience.

[0015]

In Fig. 7, the membrane switch 19 is disposed in a portion in the expansion portion 13 of the pad 1 which is further towards the front than the rupturable portion 20. In the embodiment of the present invention, as shown in Fig. 2, a membrane switch 27 as the surface switch is formed longer than the membrane switch 19 in Fig. 7 with respect to a longitudinal direction, and is disposed over substantially the whole surface of the expansion portion 13 of the pad 1. As shown in Figs. 2 and 3, a plurality of elongated hexagonal holes 27a are formed as through holes in a width-wise direction (a transverse direction in Fig. 3) at positions at a central portion of the membrane switch 27 corresponding to the rupturable portion 20.

[0016]

Next, the function and effectiveness of the embodiment will be described. As shown in Fig. 2, at normal times, since the membrane switch 27 is disposed over substantially the whole surface of the expansion portion 13, in a case where the expansion portion 13 of the pad 1 is pressed in actuating the horn, the horn can be actuated by pressing any portion of the expansion portion 13 with a normal pressing force. Therefore, the operability of the horn switch can be improved.

[0017]

In addition, as shown in Fig. 1, when there is generated an impact, a gas is generated from the inflator 7, and the airbag 9 is inflated. Then, the pad 1 is ruptured at the rupturable portion 20, and the insertion portion 13 of the pad 1 is then expanded to open together with the insert 16 and the net 16b. When this occurs, since the elongated holes 27a are formed in the portions of the membrane switch 27 corresponding to the rupturable portion 20 therealong, the membrane switch 27 can be easily ruptured along the elongated holes 27a. Moreover, since end portions of each elongated hole 27a are cut at an acute angle relative to the rupturable portion 20, stress tends to concentrate on those portions, thus securing the rupture of the membrane switch 27 at those portions.

[0018]

Consequently, when the airbag 9 is inflated, the rupturable portion 20 is ruptured as with the conventional case, and the expansion portion 13 can easily be expanded to open.

In addition, the present invention is not limited to the above embodiment, and it may be constructed as below within a range that does not depart from the spirit of the present invention.

[0019]

(1) In the above embodiment, although the membrane switch 27 is used in which the plurality of hexagonal elongated holes 27a are formed as through holes, in addition thereto, various types of membrane switches can be adopted such as, as shown in Fig. 4, a membrane switch 28 having a plurality of circular elongated holes 28a, as shown in Fig. 5, a membrane switch 29 having a plurality of circular holes 29a formed continuously, and as shown in Fig. 6, a membrane switch 30 in which a single elongated hole 30a is formed.

[0020]

(2) In the above embodiment, the insert 16 comprising the frame body 16a and the net 16b is used, for instance, a resin insert may be used instead which is formed entirely from a resin such as polypropylene.

[0021]

(3) Leather may be applied to the surface of the resin cover 17 so as to cover the same cover in order to improve the design thereof.

(4) In addition thereto, for instance, a switch such as one for an automatic drive may be provided integrally.

[0022]

#### [Effectiveness of the Invention]

According to the airbag equipped steering wheel pad of the present invention, the following advantages can be provided. In other words, the horn can be actuated by pressing any position of the pad with a normal pressing force, and the pad can easily be expanded to open when the airbag is inflated.

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**